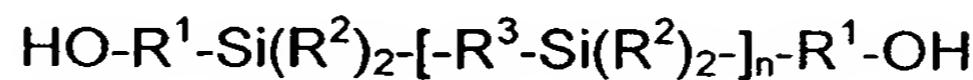


WHAT IS CLAIMED IS:

1. A segmented polymer comprising one or more soft segments comprising silane-containing groups, wherein the soft segments are
- 5 derived from a compound of the formula:



wherein:

- 10  $n = 1$  or more;  
each  $\text{R}^1$  is independently a straight chain or branched alkylene group optionally including heteroatoms;  
each  $\text{R}^2$  is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and  
each  $\text{R}^3$  is independently a straight chain alkylene group, a phenylene group, or a straight chain or branched alkyl substituted phenylene group, wherein each  $\text{R}^3$  optionally includes heteroatoms;
- 20 with the proviso that the polymer is substantially free of carbonate linkages.
- 25 2. The polymer of claim 1 which is substantially free of urea linkages.
3. The polymer of claim 1 wherein  $n = 1$  to 50.
4. The polymer of claim 1 wherein each  $\text{R}^1$  is independently a straight chain or branched (C3-C20)alkylene group.
- 30 5. The polymer of claim 1 wherein each  $\text{R}^2$  is independently an alkyl group, a phenyl group, or an alkyl substituted phenyl group.

6. The polymer of claim 5 wherein each R<sup>2</sup> is independently a straight chain or branched (C1-C20)alkyl group, a phenyl group, or a straight chain or branched (C1-C20)alkyl substituted phenyl group.

5 7. The polymer of claim 6 wherein each R<sup>2</sup> is independently a straight chain (C1-C3)alkyl group.

8. The polymer of claim 1 further comprising urethane groups.

10 9. The polymer of claim 1 wherein each R<sup>3</sup> is independently a (C1-C20)alkylene group.

10. The polymer of claim 1 wherein each R<sup>3</sup> is independently a (C4-C12)alkylene group.

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11. The polymer of claim 10 wherein each R<sup>3</sup> is independently a (C6-C10)alkylene group.

12. The polymer of claim 1 with the proviso that when R<sup>3</sup> is an

20 unsubstituted straight chain alkylene group it has more than 4 carbons.

13. The polymer of claim 1 which is a biomaterial.

14. The polymer of claim 1 which is substantially free of ether and

25 ester linkages.

15. The polymer of claim 1 which is linear, branched, or crosslinked.

16. The polymer of claim 1 further comprising one or more soft

30 segments derived from a diol that does not contain a silane-containing group.

17. The polymer of claim 1 further comprising one or more hard segments derived from a chain extender.

18. A medical device comprising a segmented polymer comprising

5 one or more soft segments comprising silane-containing groups derived from a compound of the formula:

$$\text{HO}-\text{R}^1-\text{Si}(\text{R}^2)_2-\text{[-R}^3-\text{Si}(\text{R}^2)_2\text{]}_n-\text{R}^1-\text{OH}$$

10 wherein:

n = 1 or more;

each R<sup>1</sup> is independently a straight chain or branched alkylene group optionally including heteroatoms;

15 each R<sup>2</sup> is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

each R<sup>3</sup> is independently a straight chain alkylene group, a phenylene group, or a straight chain or branched alkyl substituted phenylene group, wherein each R<sup>3</sup> optionally includes

20 heteroatoms;

with the proviso that the polymer is substantially free of carbonate linkages.

19. The medical device of claim 18 wherein the segmented polymer

25 is substantially free of urea linkages.

20. The medical device of claim 18 wherein n = 1 to 50.

21. The medical device of claim 18 wherein each R<sup>1</sup> is independently

30 a straight chain or branched (C3-C20)alkylene group.

22. The medical device of claim 18 wherein each R<sup>2</sup> is independently an alkyl group, a phenyl group, or an alkyl substituted phenyl group.

23. The medical device of claim 22 wherein each R<sup>2</sup> is independently a straight chain or branched (C1-C20)alkyl group, a phenyl group, or a straight chain or branched (C1-C20)alkyl substituted phenyl group.

5

24. The medical device of claim 23 wherein each R<sup>2</sup> is independently a straight chain (C1-C3)alkyl group.

10 25. The medical device of claim 18 further comprising urethane groups.

26. The medical device of claim 18 wherein each R<sup>3</sup> is independently a (C1-C20)alkylene group.

15 27. The medical device of claim 18 wherein each R<sup>3</sup> is independently a (C4-C12)alkylene group.

28. The medical device of claim 27 wherein each R<sup>3</sup> is independently a (C6-C10)alkylene group.

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29. The medical device of claim 18 with the proviso that when R<sup>3</sup> is an unsubstituted straight chain alkylene group it has more than 4 carbons.

25 30. The medical device of claim 18 wherein the polymer is a biomaterial.

31. The medical device of claim 18 wherein the polymer is substantially free of ether and ester linkages.

30

32. The medical device of claim 18 wherein the polymer is linear, branched, or crosslinked.

33. The medical device of claim 18 wherein the polymer further comprises one or more soft segments derived from a diol that does not contain a silane-containing moiety.

5 34. The medical device of claim 18 wherein the polymer further comprises one or more hard segments derived from a chain extender.

35. A segmented polymer comprising one or more soft segments comprising silane-containing groups of the formula:

10

$$-R^1-Si(R^2)_2-[-R^3-Si(R^2)_2-]_n-R^1-$$

wherein:

n = 1 or more;

15 each R<sup>1</sup> is independently a straight chain or branched alkylene group optionally including heteroatoms;

each R<sup>2</sup> is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

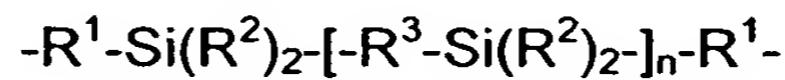
20 each R<sup>3</sup> is independently a straight chain alkylene group, a phenylene group, or a straight chain or branched alkyl substituted phenylene group, wherein each R<sup>3</sup> optionally includes heteroatoms;

with the proviso that the polymer is substantially free of carbonate linkages.

25

36. The polymer of claim 35 comprising urethane groups.

37. A medical device comprising a segmented polymer comprising one or more soft segments comprising silane-containing groups of the formula:



wherein:

5                     $n = 1$  or more;

                  each  $R^1$  is independently a straight chain or branched alkylene group optionally including heteroatoms;

10                    each  $R^2$  is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

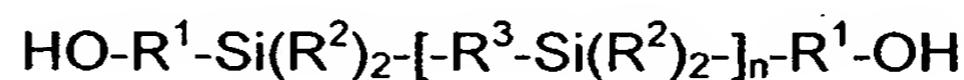
                  each  $R^3$  is independently a straight chain alkylene group, a phenylene group, or a straight chain or branched alkyl substituted phenylene group, wherein each  $R^3$  optionally includes heteroatoms;

15                    with the proviso that the polymer is substantially free of carbonate linkages.

38.                The medical device of claim 37 wherein the segmented polymer comprises urethane groups.

39.                A method of making a segmented polymer, the method

20                    comprising: combining a polyisocyanate with a compound of the formula:



wherein:

25                     $n = 1$  or more;

                  each  $R^1$  is independently a straight chain or branched alkylene group optionally including heteroatoms;

                  each  $R^2$  is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

30                    each  $R^3$  is independently a straight chain alkylene group, a phenylene group, or a straight chain or branched alkyl substituted

phenylene group, wherein each R<sup>3</sup> optionally includes heteroatoms;  
with the proviso that the polymer is substantially free of carbonate linkages.

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40. The method of claim 39 wherein the segmented polymer comprises urethane groups.